

REMARKS

Reconsideration is respectfully requested in view of the amendments and remarks herein.

The Office Action dated July 19, 2005 and final Action dated February 23, 2006 contain a rejection under 35 USC 102(b) of some of the original claims over Frost et al US 5,932,329 ("Frost"). In addition, they contain an obviousness rejection of all of the product claims under 35 USC 103(a) over Frost in view of Bolton et al US 4,906,703. There are also rejections under 35 USC 112. Applicants have presented new claims that better focus the claims on the invention.

New claim 11 is directed to a glass laminate useful for blocking the transmission of IR light, comprising a multiple layer interlayer comprising: (1) two thermoplastic polymer sheets; and (2) a film positioned between the thermoplastic polymer sheets such that the film is in direct contact on each of its surfaces with the sheets, wherein the film can either reflect or absorb IR light, and wherein the thermoplastic polymer sheets comprise an unplasticized copolymer prepared from ethylene and α,β -unsaturated carboxylic acids having from 3 to 8 carbon atoms wherein the acid groups of the copolymer have been at least partially neutralized to yield an ethylene/unsaturated copolymer ionomer.

Applicants submit that new claim 11 and the claims dependent thereon are not anticipated by Frost. Frost does not teach use of ionomer as claimed. The Actions seem to recognize this point as the anticipation rejection was not presented with respect to claims 2 and 4 of the original claims.

The general gist of the obviousness rejection is that it would have been obvious to a person of ordinary skill in the art to utilize the disclosure of Bolton in the invention of Frost to make a multilayer interlayer and glass laminate using the ionomer resin taught by Bolton to replace thermoplastic polyurethane and/or polyvinyl butyral.

The final Action points to column 3, lines 21-26, of Frost where it is stated that "any of the materials known from normal laminated glass can be considered for the adhesive layers." The Action then seems to state that since Bolton teaches the advantages of ionomer over polyvinyl butyral and polyurethane for laminated glass, the use of ionomer instead of the polyurethane and polyvinyl butyral of Frost would be obvious.

Best Available Copy

Applicants submit that the Action improperly reconstructs the invention through hindsight, and takes the cited portion of Frost out of context so as to ignore express teachings in Frost that lead away from the claimed invention.

First, it is important that the portion of Frost cited in the Action be taken in context. The entire paragraph at column 3, lines 21-29, states:

“Both for the extremely thin first adhesive layer and for the second adhesive layer, any of the materials known from normal laminated glass can be considered for the adhesive layers. Preferably, thermoplastic material is used, so that the usual production process can be adopted without modification. More preferably, proven materials such as thermoplastic polyvinyl butyrals and thermoplastic polyurethanes are used.”

Thus, from the above, it can be seen that while Frost refers to use of “any of the materials known from normal laminated glass,” Frost seems to be teaching that those materials are thermoplastic polyvinyl butyrals and thermoplastic polyurethanes. Further, even if that interpretation is incorrect, certainly Frost is leading away from any other known materials.

Here, it is important to note that Frost claims priority from an August 16, 1996 filing, which is well after the March 1990 grant date of Bolton. Moreover, from the related applications listed in Bolton, it can be seen that counterparts issued in the 1980’s. Therefore, Frost should have been well aware of the Bolton patents and their disclosure. This supports applicants’ position that the Frost patent is leading away from use of ionomer.

Second, applicants point out that the invention is not directed to use of ionomer, but to “unplasticized” sheets of ionomer. This is a very important feature of the invention since one interlayer-related problem encountered with coated IR-blocking films is that interlayers that absorb moisture and contain acidic functional groups and various ions can corrode the metal flakes or coatings that are present on some IR-blocking films. Laminates of the present invention do not contain plasticizers or other mobile components that can migrate or leach, and additionally do not promote the absorption of water. Thus the laminates of the present invention substantially reduce the occurrences of interlayer-related defects described herein.

The use of “unplasticized” sheets of ionomer as in the invention provides many benefits that are not achieved using other interlayer sheets. Unplasticized polyvinyl butyral, for example, would not be suitable for use as the interlayer which is in direct contact with the IR film because unplasticized PVB is not suitable for use in glazing due to properties such as high modulus and low tensile strength, which would negatively impact the performance of the glazing in such applications as windows and automobile windshields, for example.

Third, applicants submit that the diamines used in Bolton both crosslink and plasticize the ionomer. The addition of diamines lower the viscosity of the ionomer melt and make the polymer less stiff, and thus the diamines exhibit typical of behaviors of a plasticizer. Thus, the combination of Frost and Bolton would lead the person of ordinary skill in the art to the invention.

For the above reasons, applicants submit that the Action improperly reconstructs the invention through hindsight, and takes the cited portion of Frost out of context so as to ignore express teachings in Frost that lead away from the claimed invention. Consequently, applicants respectfully request allowance of claim 11 and the claims dependent thereon.

Claim 33 is directed to a multiple layer interlayer article useful for blocking the transmission of infra red (IR) light comprising: (1) two thermoplastic polymer sheets; and (2) a film positioned between the thermoplastic polymer sheets such that the film is in direct contact on each of its surfaces with the sheets, wherein the film can either reflect or absorb IR light, and wherein the thermoplastic polymer sheets comprise an unplasticized copolymer prepared from ethylene and α,β -unsaturated carboxylic acids having from 3 to 8 carbon atoms wherein the acid groups of the copolymer have been at least partially neutralized to yield an ethylene/unsaturated copolymer ionomer. Claim 34 is directed to a process for manufacturing a glass laminate as claimed in claim 1 comprising: (a) providing the two thermoplastic polymer sheets; (b) providing the film; (c) forming a multiple layer interlayer comprising the film adhered to the two thermoplastic polymer sheets; and (d) forming the glass laminate. Claim 35 is directed to a process for manufacturing a glass laminate useful for blocking the transmission of IR light comprising the steps: (a) providing two thermoplastic polymer sheets comprised of an unplasticized copolymer prepared from ethylene and α,β -unsaturated carboxylic acids having from 3 to 8 carbon atoms wherein the acid groups of the copolymer have been at least partially neutralized to yield an ethylene/unsaturated copolymer ionomer; (b) providing a film that can either reflect or absorb IR light; (c) providing two layers of glass; (d) assembling the two thermoplastic polymer sheets and film to form a multiple layer assembly; (e) laminating the multiple layer assembly to form a multiple layer interlayer comprising the film adhered to layers formed from the two thermoplastic polymer sheets; and (f) forming a glass laminate with the two glass layers on the outside and the multiple layer interlayer on the inside, wherein at least one thermoplastic polymer sheet is adhered to at least one layer of the glass. Applicants respectfully submit that these claims are also patentable for the foregoing reasons.

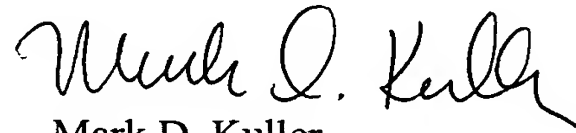
Claim 12 is directed to a glass laminate wherein at least one of the layers of laminate materials used in the IR-blocking laminate is primed using a priming agent prior to lamination. Claim 13 is directed to a glass laminate wherein the film is primed using a priming agent prior to lamination. Claim 14 states that the priming agent is a silane compound or solutions thereof. Claim 16 states that the priming agent is an aminosilane compound or solutions thereof. Applicants submit that the cited documents do not teach the advantages of priming, particularly with a silane or aminosilane, and most particularly when the film is primed as claimed. The priming steps provide improved 90° peel strength. Particularly surprising results were obtained when the priming agent was applied directly to the film.

Applicants note that a restriction requirement was presented in the parent application. Applicants present process claim 34 and other process claims herewith. Claim 34 depends from claim 11, and thus if claim 11 is considered allowable applicants respectfully request that claim 34 be rejoined as described in MPEP821.04. Applicants submit that the other process claims are also appropriate for rejoinder.

Best Available Copy

In view of the foregoing, allowance of the above-referenced application is respectfully requested. Should any matters remain unresolved by this response, the Examiner is invited to telephone the undersigned at the below-listed direct dial telephone number in order to expedite prosecution.

Respectfully submitted,



Mark D. Kuller
Attorney for Applicant
Registration No.: 31,925
Telephone: (302) 892-1354
Facsimile: 302-992-3257

Dated: April 24, 2006

Best Available Copy